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10/502,091

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EXAMINER

BRANDT, CHRISTOPHER M

ART UNIT

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2617

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--|--------------------------------------|--|
| Office Action Summary | Application No. 10/502,091 | Applicant(s) SUDO, HIROAKI | |
| | Examiner CHRISTOPHER M. BRANDT | Art Unit 2617 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 February 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9, 13-18, 20, 21 and 23-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 13-18, 20, 21 and 23-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 September 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>04/15/2008</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement submitted on April 15, 2008 has been considered by the examiner and made of record in the application file.

Response to Amendment

This Action is in response to applicant's amendment filed on February 15, 2008. **Claims 1-9, 13-18, 20, 21, and 23-29** are now currently pending in the present application. **This Action is made FINAL.**

Response to Arguments

Applicant's arguments with respect to claims 1-9, 13-18, 20, 21, and 23-29 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-9, 13-18, 20, 21 are rejected under 35 USC 103(a) as being unpatentable over **Walton et al. (US PG PUB 2003/0081538 A1, hereinafter Walton)** in view of **Arai et al. (US Patent 6,456,607 B2, hereinafter Arai)** and further in view of **Sakoda et al. (US PG PUB 2002/0118659 A1, hereinafter Sakoda)**.

Consider **claim 1 (and similarly applied to claims 21, 28, and 29)**. Walton discloses an OFDM-CDMA transmitting apparatus comprising:

a first spreading section that spreads specific transmit symbols using a first spreading factor (figure 3 paragraphs 10, 11, 29, 109, read as a data spreader at a transmitter unit to spread the coded data for each user with a respective set of one or more spreading codes. Walton also discloses different spreading factor of SF being used for a data rate);

a second spreading section that spreads other transmit symbols than the specific transmit symbols using a spreading ratio smaller than the first spreading factor (figure 3 paragraphs 10, 11, 29, read as a data spreader at a transmitter unit to spread the coded data for each user with a respective set of one or more spreading codes. Walton also discloses different spreading factor of SF being used for a data rate. Particularly, Walton discloses that lower data rates may be accommodated by power scaling the data such that the transmit power per frame is proportional to the data rate based on different spreading factors); and

an orthogonal frequency division multiplexing section that distributes the multiplexed spread signals among a plurality of subcarriers.

Walton substantially discloses the claimed invention but fails to explicitly teach a number of multiplexing selection sections that select a number of multiplexing for the specific transmit symbols and a number of multiplexing for the other transmit symbols and a multiplexing section

that multiplexes a spread signal of the specific transmit symbols spread by the first spreading section by the selected number of multiplexing and a spread signal of said other transmit symbols spread by the second spreading section by the selected number of multiplexing.

However, Arai discloses teach a number of multiplexing selection sections that select a number of multiplexing for the specific transmit symbols and a number of multiplexing for the other transmit symbols and a multiplexing section that multiplexes a spread signal of the specific transmit symbols spread by the first spreading section by the selected number of multiplexing and a spread signal of said other transmit symbols spread by the second spreading section by the selected number of multiplexing (figure 1 block 112, figure 2 block 210, figure 5 block 501 and 502, figure 6 block 601 and 602, column 6 lines 47-50 and 54-57, column 7 lines 10-13, 26-28, 38-42, column 9 lines 42-58, column 10 lines 1-5, 47-61, column 11 lines 6-10, 14-20).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the teachings of Arai into the invention of Walton in order to control the information amount matching the transmission path conditions (column 1 lines 60-66).

In addition, Walton and Arai fail to explicitly teach adjusting a frequency band to which the multiplexed spread signals are transmitted, by distributing the multiplexed spread signals to a plurality of subcarriers and varying a subcarrier group to which the spread signals of the multiplexed specific transmit symbols are distributed in accordance with the first spreading ratio upon distribution.

However, Sakoda teaches adjusting a frequency band to which the multiplexed spread signals are transmitted, by distributing the multiplexed spread signals to a plurality of subcarriers

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and varying a subcarrier group to which the spread signals of the multiplexed specific transmit symbols are distributed in accordance with the first spreading ratio upon distribution (paragraphs 148, 177, read as frequency-converting the transmission signal into a desired frequency band. Thus, the transmitter 100 performs multi carrier communication for transmitting the information bit stream S100 to be transmitted with pluralities of subcarriers. In addition, the transmitter can stepwise increase transmission power by using only the spread code C55 having one type of a spreading ratio, performing multiplication in parallel correspondingly to the increase of bit rates and thereafter performing multiplexing).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the teachings of Sakoda into the invention of Walton and Arai in order to disperse the transmission signal into the subcarriers and superimpose them (paragraph 148).

Consider **claim 2 and as applied to claim 1**. Walton, Arai, and Sakoda disclose wherein the number of multiplexing selection sections make the number of multiplexing of the specific symbols smaller than the number of multiplexing of the other transmit symbols (Arai; column 9 lines 33-58, column 11 lines 6-10, 14-20).

Consider **claim 3 and as applied to claim 2**. Walton, Arai, and Sakoda disclose wherein data for which better channel quality is required than for other data is allocated to the specific transmit symbols whose number of multiplexing has been reduced (Arai; column 9 lines 33-58, column 11 lines 6-10, 14-20, column 15 lines 5-15).

Consider **claim 4 and as applied to claim 2**. Walton, Arai, and Sakoda disclose wherein the specific symbols whose number of multiplexing has been reduced is placed at a start of a frame (Arai; figure 15, column 17 lines 62-67, column 18 lines 5-10, 30-45).

Consider **claim 5 and as applied to claim 2**. Walton, Arai, and Sakoda disclose wherein the number of multiplexing selection section reduce a number of multiplexing of a retransmission symbol in accordance with an increase of a number of retransmissions (Arai; column 9 lines 33-58, column 11 lines 6-10, 14-20, column 15 lines 5-15).

Consider **claim 6 and as applied to claim 2**. Walton, Arai, and Sakoda disclose wherein an M-ary modulation number of the specific symbols whose number of multiplexing has been reduced is made smaller than an M-ary modulation number of the other transmit symbols (Walton; paragraph 37).

Consider **claim 7 and as applied to claim 2**. Walton, Arai, and Sakoda disclose wherein the specific symbols whose number of multiplexing has been reduced are inserted periodically (Arai; column 9 lines 33-58, column 11 lines 6-10, 14-20, column 15 lines 53-63).

Consider **claim 8 and as applied to claim 7**. Walton, Arai, and Sakoda disclose updates a channel estimation result updating using the periodically inserted specific symbols whose number of multiplexing has been reduced (Arai; figure 4, column 7 lines 51-67, column 8 lines 41-65, column 11 lines 6-10, 14-20, column 15 lines 53-63).

Consider **claim 9 and as applied to claim 2**. Walton, Arai, and Sakoda disclose wherein the number of multiplexing of the specific symbols whose number of multiplexing has been reduced is made “1” (Arai; figures 13 and 16, steps 1301 and 1601, column 15 lines 11-14, 18-32, column 18 lines 15-25).

Consider **claim 13 and as applied to claim 1**. Walton, Arai, and Sakoda disclose wherein data for which better channel quality is required than for other data is allocated to the specific transmit symbols (Walton; abstract, paragraphs 29, 109, Arai; column 9 lines 33-58, column 11 lines 6-10, 14-20).

Consider **claim 14 and as applied to claim 1**. Walton, Arai, and Sakoda disclose wherein the specific transmit symbols are placed at a start of a frame (Walton; abstract, paragraphs 29, 109, Arai; figure 15, column 17 lines 62-67, column 18 lines 5-10, 30-45).

Consider **claim 15 and as applied to claim 1**. Walton, Arai, and Sakoda disclose wherein the first spreading section and the second spreading section increase spreading ratios of retransmission symbols in accordance with an increase of a number of retransmissions (Arai; column 9 lines 33-58, column 11 lines 6-10, 14-20, column 15 lines 5-15).

Consider **claim 16 and as applied to claim 1**. Walton, Arai, and Sakoda disclose wherein an M-ary modulation number of the specific transmit symbols is made smaller than an M-ary modulation number of the other transmit symbols (Walton; paragraph 37).

Consider **claim 17 and as applied to claim 1**. Walton, Arai, and Sakoda disclose wherein the specific transmit symbols are inserted periodically (Arai; column 9 lines 33-58, column 11 lines 6-10, 14-20, column 15 lines 53-63).

Consider **claim 18 and as applied to claim 17**. Walton, Arai, and Sakoda disclose updates a channel estimation result updating using the periodically inserted specific symbols whose spreading ratio has been increased (Walton; abstract paragraphs 29, 109).

Consider **claim 20 and as applied to claim 1**. Walton, Arai, and Sakoda disclose wherein the orthogonal frequency division multiplexing section distributes chips of the specific

symbols whose spreading ratio has been increased only in a time domain (Walton; paragraphs 9, 10, 39-41, 44, Arai; column 9 lines 33-58, column 11 lines 6-10, 14-20).

Claims 23-27 are rejected under 35 USC 103(a) as being unpatentable over **Walton et al. (US PG PUB 2003/0081538 A1, hereinafter Walton)** in view of **Arai et al. (US Patent 6,456,607 B2, hereinafter Arai)** in view of **Sakoda et al. (US PG PUB 2002/0118659 A1, hereinafter Sakoda)** and further in view of **Hwang (US PG PUB 2002/0060997 A1, hereinafter Hwang)**.

Consider **claim 23 and as applied to claim 1**. Walton, Arai, and Sakoda disclose the claimed invention but fail to explicitly teach wherein the first spreading section and the second spreading section increase a number of spreading codes assigned to a retransmission signal in accordance with an increase of a number of retransmission and perform multicode multiplexing of a retransmission signal.

However, Hwang discloses wherein the first spreading section and the second spreading section increase a number of spreading codes assigned to a retransmission signal in accordance with an increase of a number of retransmission and perform multicode multiplexing of a retransmission signal (abstract, figure 6, paragraphs 2, 3, 51, 52, 54, 84).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the teachings of Hwang into the invention of Walton, Arai, and Sakoda to insure that retransmitted data is transmitted without data loss.

Consider **claim 24 and as applied to claim 23**. Walton, Arai, Sakoda, and Hwang disclose wherein the first spreading section and the second spreading section vary the number of spreading codes assigned to the retransmission signal in accordance with a number of other code

division multiplexed signals multiplexed in the retransmission signal after multicode multiplexing (Walton; abstract, paragraphs 29, 109; Hwang; abstract, figure 6, paragraphs 2, 3, 51, 52, 54, 84).

Consider **claim 25 and as applied to claim 23**. Walton, Arai, Sakoda, and Hwang disclose a transmission power control section that increases transmission power of the multicode-multiplexed retransmission signal in accordance with the increase of the number of retransmissions(Walton; abstract, paragraphs 29, 109; Hwang; abstract, figure 6, paragraphs 2, 3, 51, 52, 54, 84).

Consider **claim 26 and as applied to claim 25**. Walton, Arai, Sakoda, and Hwang disclose wherein the transmission power control section varies the transmission power in accordance with a number of other code division multiplexed signals multiplexed in the retransmission signal after multicode multiplexing (Walton; abstract, paragraphs 29, 109; Hwang; abstract, figure 6, paragraphs 2, 3, 51, 52, 54, 84).

Consider **claim 27 and as applied to claim 21**. Walton, Arai, and Sakoda disclose the claimed invention but fail to explicitly teach wherein when the specific transmit symbols are retransmission signals, the retransmission signals are spread by a number of spreading codes in accordance with a number of retransmissions.

However, Hwang discloses wherein when the specific transmit symbols are retransmission signals, the retransmission signals are spread by a number of spreading codes in accordance with a number of retransmissions (abstract, figure 6, paragraphs 2, 3, 51, 52, 54, 84).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the teachings of Hwang into the invention of Walton, Arai, and Sakoda to insure that retransmitted data is transmitted without data loss.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any response to this Office Action should be **faxed to (571) 273-8300 or mailed to:**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Hand-delivered responses should be brought to

Customer Service Window
Randolph Building
401 Dulany Street

Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Brandt whose telephone number is (571) 270-1098.

The examiner can normally be reached on 7:30a.m. to 5p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, George Eng can be reached on (571) 272-7495. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

/George Eng/
Supervisory Patent Examiner, Art Unit 2617

Christopher M. Brandt
C.M.B./cmb
July 5, 2008

